AMENDED CLAIMS

[received by the International Bureau on 16 May 2005 (16.05.05);
original claims 1 to 22 replaced by new claims 1 to 14 (3 pages)]

1. A hydrolysis cell for generating hydrogen and oxygen from water, said cell comprising:

a casing comprising upper and lower chambers sealed together, and wherein said lower part is electrically conductive and comprises a cathode;

means for introducing make-up liquid into said cell;

means for removing produced gas from said cell;

said upper and lower chambers being separated by a gas and liquid-impervious divider which forms a seal between said upper and lower parts, said divider having at least one opening therein permitting passage of gas from said lower part to said upper part and a gas-porous but substantially liquid impervious metal filter retained within said opening to inhibit passage of liquid while permitting passage of gas.

2. The cell of claim 1 wherein said metal filter comprises compressed stainless steel powder.

3. An electrode for use in a hydrolysis cell comprising an electrically conductive shaft and a plurality of spaced apart electrically conductive metal filter discs supported on said shaft.

4. The electrode of claim 3, wherein said filter discs comprise Hastelloy™ filters.

5. The electrode of claim 3, wherein said filter discs comprise compressed stainless steel powder.

6. A hydrolysis cell comprising

a first electrode as defined in any of claims 3 to 5;

an opposed second electrode;

an electrical connection means associated with said electrodes; and

inlets and outlets to permit entry and exit respectively of electrolytic fluid and gases.

7. An hydrolysis cell comprising:

a chamber for electrolytic fluid;

an anode and cathode;

electrical connections for connecting said anode and cathode to an electrical power source and ground; and

a liquid level sensor for detecting the level of electrolytic fluid within said chamber, said level sensor comprising:

a light source for directing a beam of light into said chamber into said chamber;

a receiver for receiving light from said source, said receiver capable of discriminating between a first light level indicative of liquid at the level of said sensor and a second reduced light level indicative of liquid below the level of said sensor.

8. The hydrolysis cell of claim 7, wherein said light source comprises an infrared LED.

9. The hydrolysis cell of claim 7 or 8 further comprising a prism within said chamber positioned such that said beam is internally reflected towards said receiver in the absence of liquid in contact with said prism while in the presence of liquid in contact with said prism the beam is not substantially reflected back towards said receiver to permit said receiver to discriminate between a liquid level in contact with said prism and a level below said prism.

10. The hydrolysis cell of claim 9 wherein said light source, prism and receiver comprise a probe extend into the interior of said chamber.

11. The hydrolysis cell of any of claims 7 through 10 comprising a plurality of said level sensors positioned to detect liquid levels within said chamber indicative of liquid overfill, normal liquid height, and a low liquid level requiring replenishing of said chamber.

12. The hydrolysis cell of claim 11 further comprising a reservoir in communication with said chamber for replenishing said chamber with water,

a means to refill said chamber from said reservoir and an electronic controller in operative communication with said plurality of level sensors and means for refilling said chamber from said reservoir upon detection of a pre-selected replenishing level.

13. The hydrolysis cell of claim 12, wherein said means to refill said chamber comprises a vacuum pump in operative communication with said chamber for evacuating said chamber for drawing liquid tin said chamber from said reservoir and a controller for selectively actuating said pump upon detection of said low liquid level.

14. A hydrolysis system comprising an electrolytic cell for hydrolysis of water, a water reservoir independent of said cell, a vacuum pump for evacuating said cell to draw water into said cell from said reservoir when required for replenishing, a gas conduit leading from said cell for discharge of gases during operation of said cell, a power source, and a control subsystem for detecting a low liquid level and actuating said vacuum pump in response thereto, the system characterized by a ball valve for controlling the flow of water into said cell and gas out of said cell comprising first, second, third and fourth ports, a ball for controlling flow through said ports and a ball valve actuator for rotating said ball to selectively block flow through said ports;

a first conduit for conducting liquid from said reservoir to said first port;

a second conduit for conducting liquid from said second port to said cell;

a third conduit for conducting gas from said chamber to said third port;

a fourth conduit for conducting gas from said fourth port to said vacuum pump;

said ball valve actuation means for rotating said ball between a first position said ball valve blocks passage through all of said ports to block the inflow of liquid into said cell while blocking the outflow flow of gas through said third conduit, and a second position wherein all of said ports are open for replenishment of said cell.